



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,433	04/19/2006	Daniel Gagnon	PHUS030419US	9549
38107 7590 01/31/2008 PHILIPS INTELLECTUAL PROPERTY & STANDARDS 595 MINER ROAD CLEVELAND, OH 44143			EXAMINER KIM, KIH0	
			ART UNIT 2884	PAPER NUMBER
			MAIL DATE 01/31/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/595,433

Applicant(s)

GAGNON ET AL.

Examiner

KIHO KIM

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 4, 9 - 11, 13, and 21 - 25 is/are rejected.
- 7) ☒ Claim(s) 5 - 8, 12, 14 - 19, 20, and 26 - 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 4/19/2006
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 4, 9, 11, and 22 – 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Norton (US 3,255,054).

**Regarding independent claim 1:**

Norton anticipates a system for reversing degraded energy resolution of semiconductor radiation detection elements which are used in a radiation detector assembly, the system comprising:

a means for identifying (by noticing very high noise in Col. 2, line 28) semiconductor elements (bolometers of germanium or silicon in Col. 1, line 13) which exhibit degraded energy resolution (taught as very high noise in Col. 2, line 28) as compared to an initial level of energy resolution; and

a means (heating and supplying bias voltage as described in Col. 1, lines 59 – 70 and Col. 2, lines 20 – 26, respectively) for restoring the degraded semiconductor elements to the initial level of energy resolution.

**Regarding dependent claim 3:**

Norton anticipates the system, wherein the restoring means further includes:  
a reverse bias means (Col. 2, lines 20 – 26) which applies a reverse bias to the identified

Art Unit: 2884

degraded elements for a preselected time (for example, 24 hours in Col. 3, line 3).

**Regarding dependent claim 4:**

Norton anticipates the system, wherein the restoring means further includes:  
a heater (Col. 1, lines 59 – 70), which supplies an elevated ambient temperature, when the reversed bias is applied to the identified degraded elements, to accelerate the recovery of the degraded elements.

**Regarding independent claim 9:**

Norton anticipates a method of restoring a degraded performance of semiconductor elements comprising:

Identifying (via noticing developed noise as disclosed in Col. 2, line 28) semiconductor elements (bolometers of germanium or silicon in Col. 1, line 13) which exhibit degraded energy resolution as compared to an initial level of energy resolution; and

Restoring (via heating and supplying bias voltage as described in Col. 1, lines 59 – 70 and Col. 2, lines 20 – 26, respectively) degraded semiconductor elements to the initial level of energy resolution.

**Regarding dependent claim 11:**

Norton teaches that the method, wherein restoring includes restoring (by heating and bias as discussed above.) the identified semiconductor elements.

**Regarding independent claim 22:**

Norton teaches a system for reversing degraded energy resolution of semiconductor radiation detection elements which are used in a radiation detector assembly, the system comprising:

a means (detecting developed very high noise in Col. 2, line 28) for identifying semiconductor elements which exhibit degraded energy resolution as compared to a selectable threshold level of energy resolution; and

a means (heating and bias as described in Col. 1, lines 59 – 70 and Col. 2, lines 20 – 26, respectively) for restoring the degraded semiconductor elements to an energy resolution above the threshold level.

**Regarding dependent claim 23:**

Norton teaches the system, wherein the restoring means further includes a reverse bias means (Col. 2, lines 20 – 26) which applies a reverse bias to the identified degraded elements for a preselected time (24 hours in Col. 3, line 3).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton in view of El-Hanany *et al.* (US 2003/0085358 A1)

**Regarding dependent claim 2:**

As described in Col. 2, lines 38 - 51, Norton teaches a rearrangement of the crystal structure in detectors made of semiconductors.

However, Norton fails to teach the system, wherein the semiconductor elements include an array of crystals selected from one of cadmium-zinc-telluride crystals and cadmium-telluride crystals.

El-Hanany *et al.* teaches a detector made of CZT in paragraph [0003].

It would have been obvious to a person having ordinary skill in the art at the time of the claimed invention was made to perform restoring process as taught by Norton if the detector taught by El-Hanany *et al.* develops a very high noise in order to restore detector crystals.

**Regarding dependent claim 21:**

As described in Col. 2, lines 38 - 51, Norton teaches a rearrangement of the crystal structure in detectors made of semiconductors.

However, Norton fails to teach the apparatus, wherein the semiconductor elements include an array of crystals selected from one of cadmium-zinc- telluride crystals and cadmium-telluride crystals.

El-Hanany *et al.* teaches a detector made of CZT in paragraph [0003].

It would have been obvious to a person having ordinary skill in the art at the time of the claimed invention was made to perform restoring process as taught by Norton if the detector taught by El-Hanany *et al.* develops a very high noise in order to restore detector crystals.

5. Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton.

**Regarding dependent claim 10:**

Since Norton teaches identifying a semiconductor with reduced energy resolution by having developed noise as discussed above, it would have been obvious to a person having

ordinary skill in the art at the time of the claimed invention was made such that the method, wherein in response to identifying a semiconductor with reduced energy resolution, a service call is placed and the step of restoring is performed by a service technician in view that ordinary healthcare facilities do not carry specialized technicians to perform such a restoring process.

**Regarding independent claim 13:**

Since Norton teaches identifying and restoring degraded semiconductor elements as discussed above, Norton anticipates an apparatus for restoring performance of semiconductor elements including:

an identifying processor to detect elements with degraded performance which results after application of forward bias; and

a restoration processor which controls restoration of energy resolution of degraded elements to an initial level of energy resolution.

Norton fails to teach two processors. However, in view of the court decision (*In re Venner*, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958), the court held that broadly providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art. See MPEP 2144.04.), claim 13 is anticipated by Norton.

6. Claims 24 – 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda *et al.* (US 6,323,490) in view of Norton.

**Regarding independent claim 24:**

Ikeda *et al.* teaches a medical imaging system (in Fig. 6) comprising:

at least one detector (9253 in Fig. 6; Col. 3, line 38) comprising a plurality of semiconductor elements.

However, Ikeda *et al.* fails to teach:

a means for identifying semiconductor elements which exhibit degraded energy resolution as compared to a selectable threshold level of energy resolution; and  
a means for restoring the degraded semiconductor elements to an energy resolution above the threshold level.

As discussed above, Norton teaches a means for identifying semiconductor elements which exhibit degraded energy resolution as compared to a selectable threshold level of energy resolution and a means for restoring the degraded semiconductor elements to an energy resolution above the threshold level.

It would have been obvious to a person having ordinary skill in the art at the time of the claimed invention was made to modify the medical image system of Ikeda *et al.* with the teaching of Norton in order to restore crystallization in semiconductor elements as discussed in Col. 2, lines 39 - 51 of Norton.

**Regarding dependent claim 25:**

The teaching of Ikeda *et al.* modified by Norton has been discussed above.

Ikeda modified by Norton fails to teach the medical imaging system, wherein the restoring means further includes a reverse bias means which applies a reverse bias to the identified degraded elements for a preselected time.

Norton teaches a bias means in Col. 2, lines 20 – 26.



It would have been obvious to a person having ordinary skill in the art at the time of the claimed invention was made to modify the medical image system of Ikeda *et al.* modified by Norton with the bias means as taught by Norton in order to restore crystallization in semiconductor elements as discussed in Col. 2, lines 39 - 51 of Norton.

***Allowable Subject Matter***

7. Claims 5 – 8, 12, 14 – 20, and 26 - 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Regarding dependent claim 5:**

The prior art of record fails to teach the system, wherein the identifying means includes a screening means which facilitates identifying degradable semiconductor elements in a batch of new semiconductor elements, the screening means including:

a forward bias means, which applies a forward bias to the semiconductor elements to induce a degradation of energy resolution; and

a heater, which increases an ambient temperature to accelerate the degradation of the energy resolution in the new semiconductor elements.

**Regarding dependent claims 6 – 7:** Because their dependency on claim 5.

**Regarding dependent claim 8,** The prior art of record fails to teach the system, wherein the semiconductor elements of the detector assembly are responsive to gamma radiation.

**Regarding dependent claim 12:**

The prior art of record fails to teach the method, wherein during manufacture or assembly, the identified degradable semiconductor elements are grouped based on identified degradation criteria and groups with common degradation criteria are installed in a detector assembly and the restoring step is applied uniformly to the detector assembly.

**Regarding dependent claim 14:**

The prior art of record fails to teach the apparatus, wherein the identifying processor includes:

a pixel analyzer which analyzes a response of each semiconductor element when the semiconductor elements are subjected to a radiation source, which pixel analyzer determines a spectral response of each semiconductor element.

**Regarding dependent claims 15 - 19,** because of their dependency on Claim 14.

**Regarding dependent claim 20:**

The prior art of record fails to teach the apparatus, wherein the forward bias is selectively supplied to semiconductor elements being selected for testing, which forward bias induces degraded performance in the tested semiconductor elements and further including:

a temperature control unit which increases an ambient temperature to accelerate performance degradation in the tested semiconductor elements.

**Regarding dependent claim 26,** the prior art of record fails to teach the medical imaging system, further comprising screening initiation means that signals a start of a semiconductor element identification process to determine semiconductor elements which exhibit degraded energy resolution.

Art Unit: 2884

**Regarding dependent claim 27**, the prior art of record fails to teach the medical imaging system as set forth in claim 26 wherein the screening initiation means starts the identification process in response to a predetermined time interval, a manual maintenance initiation signal, or a system downtime signal.

***Conclusion***

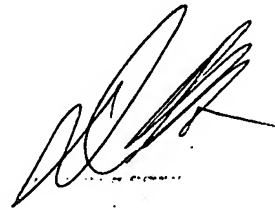
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat. No. 3,533,857 to Ogden et al. teaches a method of restoring crystals damaged by irradiation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMO KIM whose telephone number is (571)270-1628. The examiner can normally be reached on Monday - Friday 8:00 a.m. - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. K./  
Examiner, Art Unit 2884



2005